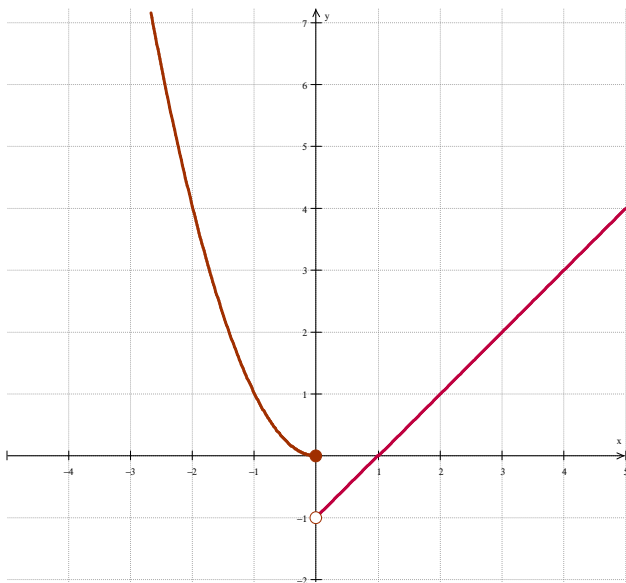


Name: _____

Piecewise Functions

Piecewise functions are functions made up of different “pieces.” See, for example, the following graph:



Do you see the two different parts?

First part equation: _____

Second part equation: _____

What x-values does the first part cover?
(express in interval notation *and* in inequality form)

Interval:

Inequality:

What x-values does the second part cover?
(express in interval notation *and* in inequality form)

Interval:

Inequality:

Now we have enough information to describe this piecewise function:

$$f(x) = \begin{cases} \text{_____} & \text{for } \text{_____} \\ \text{_____} & \text{for } \text{_____} \end{cases}$$

What this *fancy* equation tells us is that there are *two* parts to our function – and where these two parts are “valid.”

Evaluate, using the graph:

$$f(-2) =$$

$$f(-1) =$$

$$f(0) =$$

$$f(1) =$$

$$f(2) =$$

Evaluate, using the equation:

$$f(-2) =$$

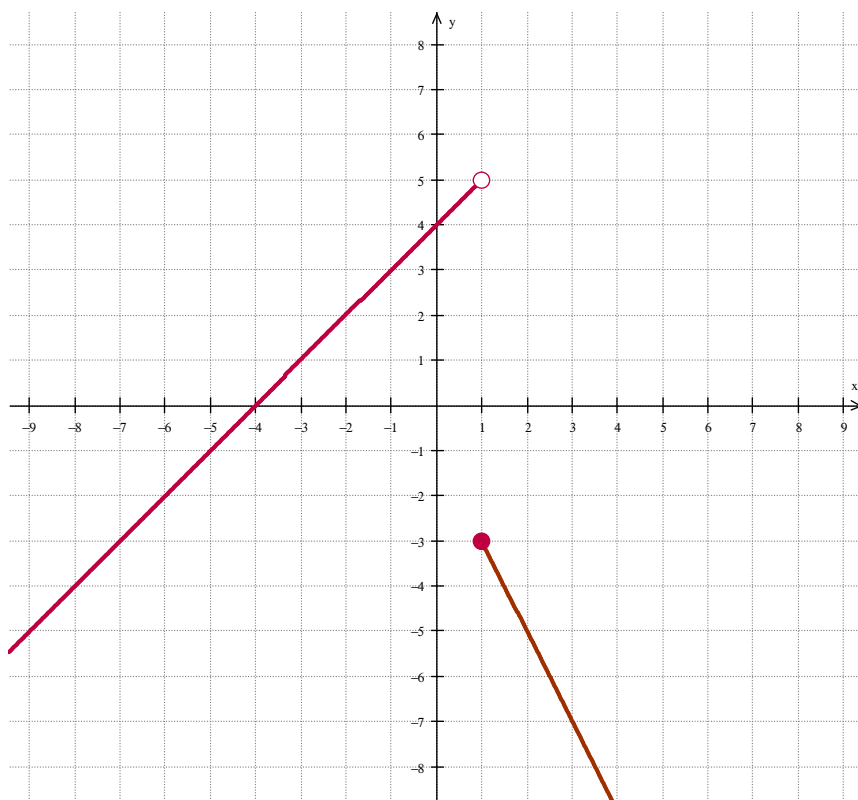
$$f(-1) =$$

$$f(0) =$$

$$f(1) =$$

$$f(2) =$$

Now that we've talked about piecewise functions, try this on your own:



Write the *piecewise function*:

$$g(x) = \begin{cases} \underline{\hspace{2cm}} & \text{for } \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}} & \text{for } \underline{\hspace{2cm}} \end{cases}$$

Evaluate the piecewise function at the following x-values:

$$g(-6) =$$

$$g(1) =$$

$$g(2) =$$

Let's do things a little differently now. I'm going to give you the piecewise function, and I want you to use it to evaluate it at some x-values, and then graph it.

$\text{Kai}(x) = \begin{cases} \frac{1}{3}x - 1 & \text{for } x \leq -3 \\ 2 & \text{for } -3 < x \leq 1 \\ x^2 & \text{for } x > 1 \end{cases}$	$\text{Kai}(-6) =$ $\text{Kai}(-3) =$ $\text{Kai}(0) =$ $\text{Kai}(1) =$ $\text{Kai}(-2.999) =$ $\text{Kai}(-3.001) =$ $\text{Kai}(1.8) =$ $\text{Kai}(10) =$
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How many pieces are there in this *piecewise function*? _____

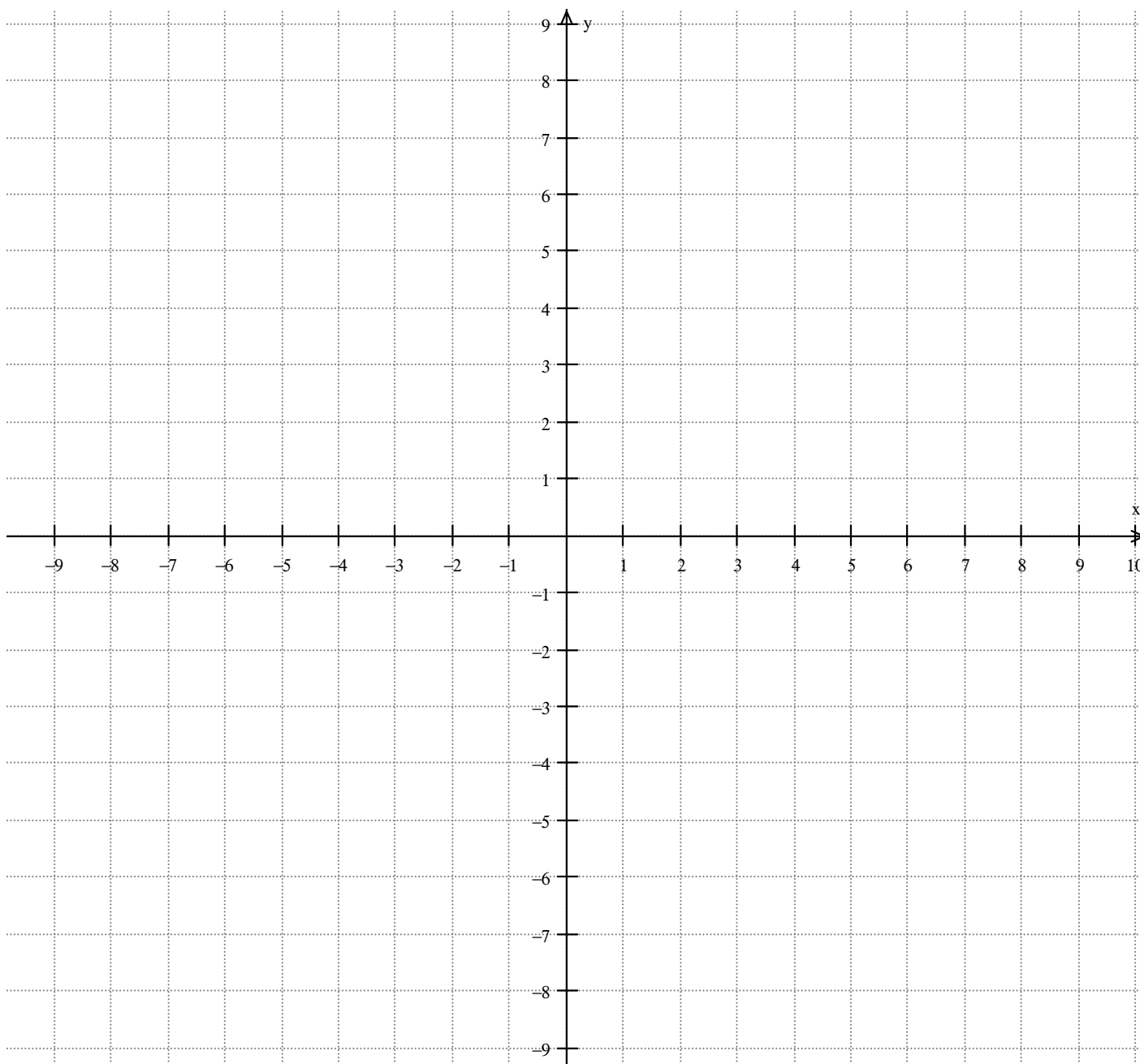
When you graph the piecewise function, what will the left-most piece look like?

When you graph the piecewise function , what will the middle piece look like?

When you graph the piecewise function, what will the right-most piece look like?

Now to graph!

$$\text{Kai}(x) = \begin{cases} \frac{1}{3}x - 1 & \text{for } x \leq -3 \\ 2 & \text{for } -3 < x \leq 1 \\ x^2 & \text{for } x > 1 \end{cases}$$

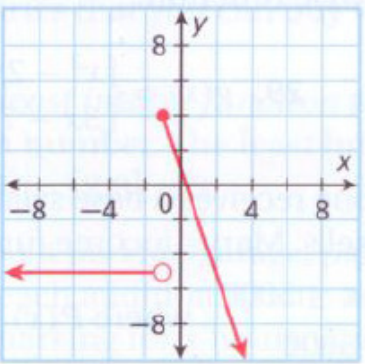
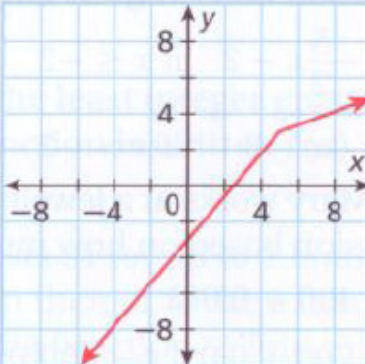
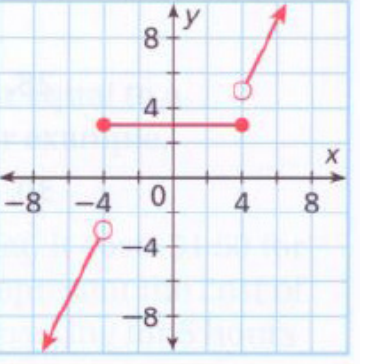


Problems!

1. Let $f(x) = \begin{cases} -8 & \text{for } x \leq 5 \\ 0 & \text{for } -5 < x < 5 \\ 5 & \text{for } x \geq 5 \end{cases}$ Evaluate $f(-6) =$
 $f(-5) =$
 $f(21) =$

2. Let $g(x) = \begin{cases} 5x-9 & \text{for } x < 2 \\ 4-x^2 & \text{for } x \geq 2 \end{cases}$ Evaluate $g(-6) =$
 $g(3) =$
 $g(2) =$

3-5: Write the piecewise function for the following graphs:

3. Graph	Equation of the pieces	Domain for the pieces	Piecewise Function
			
4. Graph	Equation of the pieces	Domain for the pieces	Piecewise Function
			
5. Graph	Equation of the pieces	Domain for the pieces	Piecewise Function
			

6. This is the mondo-mega problem. Graph the following piecewise function:

$$(x) = \begin{cases} \sqrt[3]{x} & \text{for } x < -1 \\ |x| & \text{for } -1 \leq x < 2 \\ x^2 & \text{for } 2 \leq x < 3 \\ -5 & \text{for } x \geq 3 \end{cases}$$

